

Subtraction Strategies

Bley, N.S., & Thornton, C.A. (1989). *Teaching mathematics to the learning disabled*. Austin, TX: PRO-ED.

These math strategies focus on subtraction. They were developed to assist students who are experiencing difficulty remembering subtraction facts, particularly those facts with teen minuends. They are beneficial to students who put heavy reliance on counting. Students can benefit from the following strategies only if they have ability: to recognize when two or three numbers have been said; to count on (from any number, 4 to 9); to count back (from any number, 4 to 12). Students have to make themselves master related addition facts before using subtraction strategies. These strategies are not research based.

Basic Sequence

Count back

27 Count Backs:

(10, 9, 8, 7, 6, 5, 4, 3, 2) - 1

(11, 10, 9, 8, 7, 6, 5, 4, 3) - 2

(12, 11, 10, 9, 8, 7, 6, 5, 4) - 3

Example: 12-3

Students start with a train of 12 cubes

- break off 3 cubes, then
- count back one by one

The teacher gets students to point where they touch

- look at the greater number (12 in 12-3)
- count back mentally
- use the cube train to check

Language emphasis:

See -1 (take away 1), -2, -3? Start big and count back.

Add to check

After students can use a strategy accurately and efficiently to solve a group of unknown subtraction facts, they are provided with "add to check activities." Add to check activities are additional activities to check for mastery.

Example:

Break a stick

- Making "A" train of cubes
- Breaking off "B"
- Writing or telling the subtraction sentence $A - B = C$
- Adding to check Putting the parts back together
- $A - B = C$ because $B + C = A$
- Repeating

Show with objects

Introduce subtraction zero facts

Students can use objects to illustrate number sentences involving zero

19 Zeros:

$$n - 0 = n$$

$$n - n = 0$$

(n = any number, 0 to 9)

Use a picture to help

Familiar pictures from addition that can be used to help students with subtraction doubles

6 New Doubles:

$$8 - 4$$

$$10 - 5$$

$$12 - 6$$

$$14 - 7$$

$$16 - 8$$

$$18 - 9$$

Example

12 eggs, remove 6: 6 are left.

- Using the picture to check the answer
- Providing the "add to check" activities
- Crossing out the subtraction facts from a master list

Model the counting up

15 Count ups:

$$(12, 11) - 9$$

$$(11, 9) - 8$$

$$(9, 8) - 7$$

$$(9, 8, 7) - 6$$

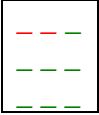
$$(8,7,6) - 5$$

$$(7,6,5) - 4$$

It is easiest to use when students do not know a fact and do not recognize it as a count back, double or 10-minuend fact.

- Starting with counters
- Using color coding
- Counting up from known part

Count up from the known fact

$\begin{array}{r} 9 \\ - 7 \\ \hline \end{array}$		$7 \text{ -- } \underline{8} \quad \underline{9}$ <p style="font-size: small; margin: 0;">I counted two more; the answer is 2.</p>
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- Starting with count up cards
- Saying the part you know
- Asking "How many numbers did I say?"

$\begin{array}{r} 9 \\ - 7 \\ \hline \end{array}$	$7 \text{ --- } \underline{8} \quad \underline{9}$ <p style="font-size: small; margin: 0;">I counted two more; the answer is 2.</p>
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Help with harder teen-minuend facts

26 Harder facts:

$$(17, 16, 15, 14, 13) - 9$$

$$(17, 15, 14, 13, 12) - 8$$

$$(16, 15, 13, 12, 11) - 7$$

$$(15, 14, 13, 11) - 6$$

$$(14, 13, 12, 11) - 5$$

$$(13, 12, 11) - 4$$

Use related addition facts as a help

13-6=7 because 6+7=13

Build on doubles

12-6=6, so 13-6 is one more (7)
 12-6=6, so 11-6 is one less (5)

10-minuend facts that they already know

10-7=3, so 11-7 is one more (4)

10-7=3, so 9-7 is one less (2)

Subtract 9

(a)
$$\begin{array}{r} 13 \\ - 9 \\ \hline \end{array}$$

The sum of these digits is the answer.

(b)
$$\begin{array}{r} 13 \\ - 9 \\ \hline \end{array}$$

The answer is 1 more than the answer to $\begin{array}{r} 13 \\ - 10 \\ \hline \end{array}$

(c)
$$\begin{array}{r} 13 \\ - 9 \\ \hline \end{array}$$

The answer is 1 more than the ones digit.

Subtract through 10

Help students recognize how fact pairs differ

(a). $\begin{array}{r} 10 \\ - 6 \\ \hline \end{array}$ (b). $\begin{array}{r} 10 \\ - 8 \\ \hline \end{array}$ (c). $\begin{array}{r} 10 \\ - 4 \\ \hline \end{array}$ (d). $\begin{array}{r} 10 \\ - 4 \\ \hline \end{array}$

$\begin{array}{r} 13 \\ - 6 \\ \hline \end{array}$ $\begin{array}{r} 14 \\ - 8 \\ \hline \end{array}$ $\begin{array}{r} 12 \\ - 3 \\ \hline \end{array}$ $\begin{array}{r} 13 \\ - 4 \\ \hline \end{array}$

Example:

- 13 is 3 more than 10.
- Modeling how to use 10-frame
- Placing 3 counters outside a full frame
- The answer to 13-6 is just three more than that of 10-6
- Repeat and continue until students are aware of the pattern

Help students identify their "zero" fingers

- Getting students to note their zero fingers

Showing the students how to use the zero fingers

- Having the students use the zero fingers to cover the ones digit of a problem
- Seeing how the problem 'looks like' the easy "10" problem (Read '10-6')

Practice subtracting from 10 and adding the extras

- Writing a teen-minuend problem
- Covering the ones digit of the minuend with the zero finger
- Giving the answer to the easy "10" problem
- Removing the zero finger and adding in the extra ones
- Repeating for other teen-minuend facts
- Following through with and "add to check" activity

